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EXAMINER

RHEE, JANE J

ART UNIT

PAPER NUMBER

1772

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12

Please find below and/or attached an Office communication concerning this application or proceeding.

AS/12

# Office Action Summary

Application No.

09/751,235

Applicant(s)

WONG, ALAN

Examiner

Jane J Rhee

Art Unit

1772

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

1. Claims 1-5 and 12 are rejected under 35 U.S.C. 102(e) as being unpatentable by Hijzen et al. (6368921).

Hijzen et al. discloses a structure comprising a first pair of features disposed in a substrate and left exposed (figure 9 number 51 and 10a), the first pair of features being equidistant from the first centerline; a second pair of features disposed in the substrate and left embedded below a layer of material (figure 9 number 17), the second pair of features being equidistant from a second centerline; and a third pair of features disposed in the layer of material (figure 9 number 17), the third pair of features being equidistant from a third centerline, wherein deviation among the first, second, and third centerlines is a measurement of overlay. Hijzen et al. discloses that the first separation

between the first centerline and the third centerline is a post-etch overlay (figure 9). Hijzen et al. discloses that the second separation between the second centerline and the third centerline is a post develop overlay (figure 9). Hijzen et al. discloses that the third separation between the first centerline and the second centerline is an exposed to embedded offset in overlay (figure 9). Hijzen et al. discloses that the exposed to embedded offset in overlay can correct a post develop overlay to predict a post etch overlay (figure 9). Hijzen et al. discloses that the first pair, the second pair, and the third pair of features are parallel (figure 9 number 51 and 17).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 12 is rejected under 35 U.S.C. 102(b) as being unpatentable by Morikawa (5308682).

Morikawa discloses a structure comprising a first pair of features disposed in a substrate and left exposed (figure 4c number 39a), the first pair of features being equidistant from the first centerline; a second pair of features disposed in the substrate and left embedded below a layer of material (figure 4c number 37a and 37b), the second pair of features being equidistant from a second centerline; and a third pair of features disposed in the layer of material (figure 4c number 37c and 37d), the third pair

of features being equidistant from a third centerline, wherein deviation among the first, second, and third centerlines is a measurement of overlay. Morikawa discloses that the first separation between the first centerline and the third centerline is a post-etch overlay (figure 4c). Morikawa discloses that the second separation between the second centerline and the third centerline is a post develop overlay (figure 4c). Morikawa discloses that the third separation between the first centerline and the second centerline is an exposed to embedded offset in overlay (figure 4c). Morikawa discloses that the exposed to embedded offset in overlay can correct a post develop overlay to predict a post etch overlay (figure 4c). Morikawa discloses that the first pair, the second pair, and the third pair of features are parallel (figure 4c numbers 39 and 37a,b,c,d).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hijzen et al. in view of Farrar (6413827).

Hijzen discloses that the first pair of features and the second pair of features comprises trenches (figure 9 number 17). Hijzen discloses that the third layer is transparent (figure 2 number 52). Hijzen fail to disclose that the trenches are filled with dielectric material. Hijzen fail to disclose that the second pair of features are trenches

filled with dielectric material and covered with transparent material. Farrar teaches trenches filled with the dielectric material, silicon dioxide for the purpose of obtaining improved values of capacitive coupling (col. 2 lines 48-50). Silicon dioxide is notoriously well known in the art to be a transparent material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided Hijzen with trenches filled with the dielectric material, silicon dioxide in order to obtain improved values of capacitive coupling (col. 2 lines 48-50).

4. Claims 9-11 rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa in view of Bostrom (3731085).

Morikawa discloses the structure above. Morikawa fail to disclose that the first, second or third features comprise holes filled with opaque material. Bostrom discloses holes filled with opaque material for the purpose of forming a code to impart evidence of identification (col. 1 line 66).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided Morikawa with holes filled with opaque material in order to form a code to impart evidence of identification (col. 1 line 66) as taught by Bostrom.

5. Claims 1-3,6, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (figure 1 and 2 and pg 2-4).

Applicant's admitted prior art discloses a first pair of overlay bars disposed in a substrate and left exposed, the first pair of overlay bars being equidistant from a first

centerline (figure 1 number 45 and 52), a second pair of overlay bars disposed in the substrate and left embedded below a layer of material, the second pair of overlay bars being equidistant from a second centerline (figure 1 number 15, 14 and 40) wherein the overlay bars are trenches filled with dielectric material (pg 3 lines 18-19). Applicant's admitted prior art discloses that the first and second pairs are parallel (figure 1 numbers 15 and 45). Applicant's admitted prior art fails to disclose a third pair of overlay bars disposed in the layer of material, the third pair of overlay bars being equidistant from a third centerline.

However, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to have provided a third pair of overlay bars disposed in the layer of material in order to have provided a simpler overlay measurement system wherein one is able to measure the overlay after develop and after etch more consistently.

### ***Response to Arguments***

6. Applicant's arguments filed November 25, 2002 have been fully considered but they are not persuasive.

In response to applicant's argument that Examiner has not explained which portions of the structure in Figure 9 of Hijzen et al. teach the first, second and third pair of features, applicant claims a first pair of features disposed in a substrate, Hijzen et al. teaches in figure 9 number 51 a first pair of features disposed in a substrate number 10a. Hijzen et al. teaches in figure 9 number 17 two pairs of features since there are four features all together, the second and third feature wherein the second pair of

features is disposed in the substrate (10a) and left embedded below a layer of material (10a). The third pair of features is disposed in the layer of material (10a). Examiner views the substrate and the layer of material as one and the same limiting structure.

In response to applicant's argument that Examiner has not explained which portions of the structure in figure 9 of Hijzen et al. teach the first centerline, the second centerline, and the third centerline, the centerline of the first, second, and third features in figure 9 is an imaginary line that divides through the center of the first, second and third features.

In response to applicant's argument that Hijzen et al. does not teach the post etch overlay, the post develop overlay, the exposed to embedded offset in the overlay or the correction of post develop overlay to predict post etch overlay, the post develop overlay is understood as the difference between the centerline of the first feature and the centerline of the second feature. Hijzen et al. discloses first and second features wherein both features inherently possess centerlines therefore, the difference between the first centerline and the second centerline would calculate the post develop overlay. The post etch overlay is understood as the difference between the centerline of the first feature and the centerline of the third feature. Hijzen et al. teaches a first and third pair of features wherein both pair of features inherently possess centerlines therefore difference between the first and third centerlines would calculate the post etch overlay. The exposed to embedded overlay offset is understood as the difference between the overlay for the post etch condition and the overlay for the post develop condition. Also



the offset of the exposed embedded overlay is understood to be able to be used to correct subsequent measurements of overlay after develop.

In response to applicant's argument that Hijzen et al. does not teach a parallel relationship among the first pair, second pair, and the third pair of overlay bars, Hijzen et al. does teach a parallel relationship among the first pair, second pair, and third pair of overlay bars (figure 9 number 51 and 17). The second pair and third pair are parallel beside one another. The first pair and second pair or third pair are parallel wherein the first pair is on the top row and the second pair or third pair are in the second row the two rows are parallel to each other.

In response to applicant's argument that Examiner does not explain which portions of the structure in figure 4c of Morikawa teach the first pair of features, the second pair of features, and the third pair of features, the first pair of features is 39a and 39b, the second pair of features is 37a and 37b, and the third pair of features is 37c and 37d. The second pair of features can even be 37a and 37d while the third pair of features can be 37b and 37c. Applicant argues that 37a, 37b, 37c, 37d are all identical to each other, however, the second and third pair of features obtain no differential characteristics since the substrate wherein the second pair of features is disposed in and the layer of material that the second pair of features are left embedded below of and the third pair of features are disposed in are not differentiated from one another, therefore, the substrate and the layer of material can be made of the same material.

In response to applicant's argument that Examiner has not explained which portions of the structure in figure 4c of Morikawa teach the first centerline, the second

centerline, and the third centerline, the centerline of the first, second, and third features in figure 4c is an imaginary line that divides through the center of the first, second and third features.

In response to applicant's argument that there is no suggestion to combine the references of Hijzen et al. and Farrar, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Hijzen et al. teaches that the first pair of features and the second pair of features comprise trenches, however fails to disclose that the trenches are filled with dielectric material. Farrar teaches trenches filled with the dielectric material, silicon dioxide for the purpose of obtaining improved values of capacitive coupling (col. 2 lines 48-50).

In response to applicant's argument that there is no suggestion to combine the references of Morikawa and Bostrom, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case,

Morikawa fail to teach the first, second, or third features comprising holes filled with opaque material and Bostrom discloses holes filled with opaque material for the purpose of forming code to impart evidence of identification.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jane J Rhee whose telephone number is 703-605-4959. The examiner can normally be reached on M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon can be reached on 703-308-4251. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Jane Rhee  
January 30, 2003



HAROLD PYON  
SUPERVISORY PATENT EXAMINER  
1772

2/4/03